**The HIV melting pot**Schoofs, Mark *The Village Voice;* Feb 18, 1997; 42, 7; ProQuest pg. 43

# THE HIV MELTING POT



An IV-drug user guards against the virus by getting clean syringes at the Bronx-Harlem Needle Exchange.

# NEW YORK SLUMS ARE THE PROMISED LAND FOR THIS HIGHLY MUTABLE VIRUS

#### **By Mark Schoofs**

undreds of shooting galleries are hidden in the slums of New York City, some in abandoned buildings, others in shanty shacks. One, nestled under the Bruckner Expressway in the South Bronx, is immaculately swept, furnished with an old sofa and an automobile seat, and softly lit by candles. It looks like a shrine, and its "owner," a man named Mike, says that more than 100 addicts stop by every day to engage in the often ritualized act of shooting up.

"Addicts can't buy syringes, and the needle exchange program is only open a few hours a day," says the Reverend Margaret Reinfeld, a veteran AIDS worker who recently ran a program that provides clean syringes to drug users. The result, of course, is that many addicts still share needles, and many HIV-negative people are still getting infected.

But Reinfeld also worries about something else: HIV-positive people could reinfect themselves with additional strains of the virus. "There's a tremendous HIV soup out there," she says. "There may be three strains of virus in one needle."

What are the ramifications? Most immediately, people who are succeeding on the widely heralded protease-inhibitor cocktails could sabotage their newfound health by getting infected with a strain that is resistant to their medication. This could be more than an individual tragedy. New York City recently reported a dramatic drop in AIDS deaths, but resistant strains could make this gain short-lived.

February 18, 1997 VILLAGE VOICE 43







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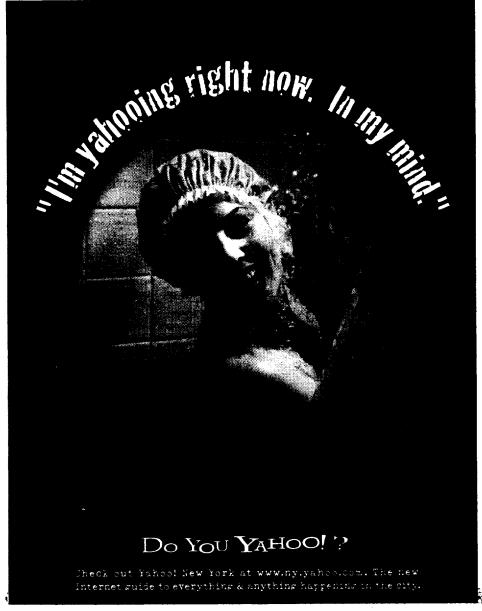
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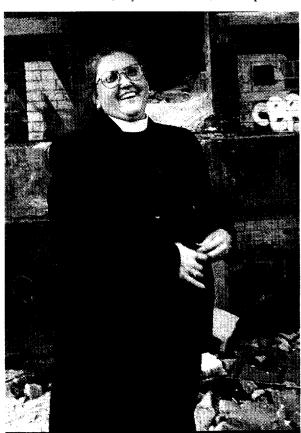
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**Schoofs** 

On the horizon, there is another worry. HIV is amazingly protean. It changes, both by the gradual accumulation of small mutations and by "recombination," a process in which two strains mix to form a hybrid. Through recombination, the virus can instantly and radically

HIV has been in large human populations for only about 20 years, which is not very long in terms of evolution," says William Paul, who



"There's a tremendous HIV soup out there," says the Reverend Margaret Reinfeld, a veteran AIDS worker. "There may be three strains of virus in one needle."

heads the U.S. government's AIDS research program. Paul emphasizes that he isn't talking about some science-fiction scenario where HIV would go airborne. "But suppose that HIV became several times more infectious," Paul says. "Conceivably, that could happen by a just subtle change in the virus, but it would have a profound impact on the epidemic."

Theoretically, it is in the best interest of HIV not to kill its host, because then the virus dies, too. So HIV might well evolve into a less virulent strain that causes a milder disease. On the other hand, it's very advantageous for HIV to spread more easily, and therefore, many scientists believe the virus will eventually become more infectious.

Researchers have identified 10 major "sub-types" of HIV, labelled A through J, and they continue to find more. There have been suggestions that some of these subtypes are more infectious or more virulent, but so far there is no proof. "We know very little" about what the diversity of HIV means, says Francine McCutchan, a leading expert in the field. But, she adds, "It can't be good." The increasing swarm of variants "is one for the virus" because, she explains, when different subtypes mix together, "the virus can reshuffle its parts" to create new and possibly stronger strains.

"My population has repeated exposure to strains on the street," says Reinfeld. New strains of HIV, she adds, "really is the emerging issue of the future."

raditionally, the most likely places for such reshuffling have been countries such as Uganda or India, where many subtypes are circulating and where the epidemic is out of

control. But now, New York might be a melt ing pot for HIV.

Kathleen Irwin, a researcher at the Center. for Disease Control, examined the virus fron 43 HIV-positive residents of the Bronx. At least two, and as many as eight, of these patients are infected with HIV variants that have previously been found almost exclusively in areas of Asia. Africa, and South America.

To make sense of Irwin's findings, it's useful to understand some terminology.

A "strain" generally indicates a small variation in the genetic code of viruses. An HIV-positive person often has several strains in his or her body.

A subtype-which is also called a "clade," from the Greek for branch is a variant that is genetically much different. Finally, some types of HIV are so distinct that researchers lump them into a category called Group O, for "Outlier" viruses.

Clade B is the dominant subtype in North America and Europe, though most of the world's clades have been found in the U.S. In almost every case, however, these atypical clades were present in travelers, immigrants, or soldiers returning from tours abroad. The findings in the Bronx raised eyebrows not only because non-B subtypes were present, but also because evidence suggests one patient contracted the usual virus here.

"If you look at New York City, it's what you would expect," says Peter Piot, a veteran researcher who heads the United Nations' AIDS program. "We're a global village. The viral strains travel as much as people."

Almost certainly, other subtypes are on the way. Researchers in Puerto Rico recently found two people infected with subtype Fthe first cases of that clade in U.S. territory—and four people infected with both B and F. "Puerto Rico serves as a double gateway connecting North and South America," concluded the study. Indeed,

Puerto Rico is a popular tourist destination, as well as the homeland of about a million New Yorkers. Lead researcher Idhaliz Flores notes, "There are four flights a day between San Juan and New York."

'd hate to go back to the beginning of the epidemic, when everyone was blaming Haitians for spreading the virus," says Carlos Maldonado of the Latino Commission on AIDS. His colleague, Dennis deLeon, remembers when Irwin's discovery of new subtypes first broke last summer: "Reporters were asking about different national groups," he says, "because they wanted to know which ones were spreading this 'foreign' virus." Such journalistic "fear mongering," he says, could incite an anti-immigrant backlash based on "the specter of national viruses."

DeLeon also worries that the discussion will scare people of color away from treatment. Many are skeptical of the new drugs, fearing that they will be used as guinea pigs, or even that the drugs are a plot to poison them. The re-cent focus on HIV's mutability has fueled these fears, says deLeon. "There's enormous inexactitude in the discussion. People are blurring the talk about strains and resistance, and they get so afraid that they are not starting therapy. The emphasis needs to be placed on overcoming treatment phobia, not on a hypothetical super-

mutant virus devouring New York."
Still, says deLeon, "It's important to understand the differences between the viruses." Indeed, while the new protease inhibitors work equally well against all major clades, some diagnostic tests haven't. For example, Group O didn't show up on screening tests that protect the nation's blood supply. That problem has been corrected, but constant surveillance is required to monitor for emerging clades.

The South Bronx was one of the first areas of the country that the CDC surveyed for new subtypes of HIV. One reason why is that this section has one of the highest HIV rates in the city.

A generation ago, the virus would have found the South Bronx far less hospitable. "When I was growing up there," recalls city AIDS czar Ronald Johnson, "there was one drug dealer in our building. But if I had tried to

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says one researcher.

buy from him, my parents and every other adult would have whipped me—and so would the dealer himself. There was a strong sense of community, but that has been destroyed."

In the 1970s, the city closed many of the fire-houses serving Harlem and the South Bronx, and what followed was a slow but disastrous burnout, consuming hundreds of buildings, displacing thousands of

residents, and rending the social fabric. Though both neighborhoods are coming back, scars remain. "It's like Germany after the war," says Mindy Fullilove, a social reseacher who studies the "confluence of plagues"—poverty, drugs, and urban blight—that have ravaged Harlem and the Bronx. "There are several lines of recovery that need to take place."

Until that happens, the South Bronx will be HIV's promised land. Poor and often homeless drug users offer the virus multiple points of entry: sharing needles, sex with a steady partner, and survival sex. Sleeping in a shooting gallery—or sometimes using it to get high—requires a fee, often paid in sexual currency. Even better, from the virus's point of view, is that addicts and homeless people frequently move. "If the cops clean up a shantytown or sweep an area of prostitutes, all those people are dispersed to other areas," says Reinfeld. Then they mix with new drug and sex partners, until they have to move yet again.

Finally, it can be extremely hard to motivate addicts to stay safe because, says Reinfeld, they are beaten down so badly that they see no future for themselves. "I lost my girlfriend to a heroin OD last month," says Trish, an addict in Hunts Point. She sweeps her blond hair out of her face, which is smudged with dirt and marred by scabs. When high on her favorite drug mixture—heroin cut with a little cocaine—she scratches herself uncontrollably. Where does Trish see herself in five years? She looks startled by the question, then she chuckles: "Dead."

Reinfeld ticks off the risk factors: "Highly mobile, overlapping social networks, multiple avenues of HIV exposure. That looks like the San Francisco bathhouses in 1979." With one big difference: Back at the beginning of the epidemic, HIV was more homogenous. It could

mutate, but there was far less chance that it could recombine. Now, in New York, it can do both. "Everywhere we see clades commingling," says Beatrice Hahn, an expert on HIV variation, "we see recombinants."

If mutation were its only weapon, HIV would still be a formidable enemy. On average, the virus is estimated to produce one alteration to its genetic code every time it infects a new cell. In addition, HIV is unimaginably prolific, infecting 10 million new cells every day. The

math is dizzying: With more than 22 million people infected globally, HIV is probably making every conceivable mutation many times every day.

But recombination can leapfrog even this process. It works like this: Two different viruses infect the same cell. Each begins the deadly business of copying its RNA onto the host cell's DNA. (This turns the host cell into a factory

for new HIV.) Sections of the RNA from each virus combine to form a new "mosaic" strain. It might be weaker than either parent, but it also could be stronger, or more easily transmissible. "If there are more subtypes, then there will be more recombinants," says Piot. "There is genetic engineering going on in nature. The virus is experimenting with itself."

Indeed, recombinants and new subtypes have proliferated very quickly, astonishing and puzzling researchers. "We don't understand to this day what the global distribution of subtypes means," says McCutchan, "why B initially spread outside of Africa, or why subtypes we never heard of infected more than a million people a few years later. Why are clades C and F in Brazil, why is G in Russia? Why C in India and E in Thailand? There must have been multiple introductions of subtypes, so why did one take and spread? We wonder."

What would happen if a more infectious strain of HIV emerged? Though some news accounts have warned that such strains could ignite a raging middle-class heterosexual epidemic, researchers believe this is unlikely. In its current form. HIV is far less infectious than most sexually transmitted diseases. Even a super strain of HIV probably wouldn't be as transmissible as herpes or gonorrhea. Because it is relatively hard to catch, HIV flourishes best in poverty, or where there are high rates of untreated STDs, or where people have large numbers of sex or IV-drug partners. None of those conditions is as prevalent in middle-class communities as in slums. Nevertheless, a more infectious virus would accelerate the slow diffusion of HIV from the inner cities out to the

For gay men, the risk is much greater. CONTINUEDON PAGE 46

# The Needle Nightmare

The most disheartening thing I can tell you," says veteran AIDS worker Margaret Reinfeld, "is that we know how to bring the epidemic to a dead halt among injection drug users, but the political will does not exist to do that."

The overwhelming majority of research on needle exchange shows that it dramatically reduces the spread of HIV and does not encourage drug abuse. The National Academy of Sciences has endorsed and recommended needle exchange. And a recent New York study found that addicts halved their risk of

contracting HIV if they used a syringe program. The tragedy, says Reinfeld, is that 90 per cent of New York's IV-drug users lack access to such programs.

The reason? Neither the federal govern-

The reason? Neither the federal government nor New York City spends a penny on needle exchange. And the state, which probably couldn't handle the full burden alone, spends only \$1.5 million per year on syringe programs. Meanwhile, more than half of all new HIV infections in the U.S. are generated, directly or indirectly, through IV-drug use.

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Recent hope that AIDS is becoming a manageable disease may be leading many to lower their guard on safer sex. Also, gay men tend to have more partners than heterosexuals, and urban gay culture is more mobile. Gay men from different social classes frequently partner up, giving a new strain of HIV many points of entry into the gay community.

But no one is as vulnerable to a new strain as poor IV-drug users. Beset by all of HIV's henchmen—poverty, STDs, and multiple sex and drug partners—they are sitting ducks for a more infectious strain. "AIDS is a disease of marginalization," says researcher Rodrick Wallace. "The most marginalized are hit hardest."

Reinfeld notes that half the city's 100,000 IV-drug users are thought to be infected with HIV. "All those people have boyfriends, girlfriends, lovers, and all other kinds of sexual partners. That's the piece I would expect to accelerate," she says. Indeed, it's possible that relatively low-risk acts, such as oral sex, could get more risky. "If you have a more easily transmissible strain," says Reinfeld, "all of a sudden every slip in condom use has much higher consequences."

any researchers used to believe the opportunity for recombination was severely limited, because they thought separate strains of HIV could only infect a person during the few weeks before one strain takes hold. After that, reinfection was widely thought to be almost impossible. But that view is being shaken.

Researchers have been able to infect



Scarce support: This program is open only several hours a day.

chimpanzees with two different strains of HIV administered a full two years apart. There are also numerous reports of people infected with separate clades. Dr. Andrew Artenstein authored one of the first reports, of a Thai man infected with clades B and E. "I can't absolutely prove" that this patient got infected with one clade after the first had taken hold, says Artenstein. "But I'm convinced he was." The chimp experiments support his conviction: A second infection—and therefore recombination—

could occur at any point in a person's illness.

Importantly, it takes a lower dose to reinfect chimps intravenously than vaginally. So IV-drug users, says chimp researcher Patricia Fultz, may be the most susceptible to reinfection and recombination. Thus, slums not only have the people who are most vulnerable to new strains, they also foster the risk factors most likley to *create* such strains.

Piece by piece, the story of a woman we'll call Jill comes together. Jill had been released from prison into a mandatory, residential drugrehabilitation center. But the rigorous daily

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conceivable

every day.

schedule was too demanding: "I'm HIV," she says, "and I got too tired." So she skipped out. Homeless and a fugitive, she binged on drugs and, in the misery of an overdose, stopped taking her HIV medicine.

That's a big problem, because her drugs—including a protease inhibitor—must be taken on a strict schedule or the virus can swiftly develop resistance. In that case, the drugs will fail. Virol-

ogists, doctors, and social workers are all worried about the ability of patients—all patients, but especially those without social support—to stay on the strict regimens.

Even people who take their drugs religiously could be reinfected with a resistant virus. Many HIV-positive people have not practiced safer sex (or safer drug use) when they are

with partners who are also infected. Their feeling was, How much worse can it get? The answer now appears to be, A lot worse. An effective drug regimen could be toppled by a secondary infection with a resistant strain.

Moreover, two viruses can recombine into a super strain that is resistant to several drugs. Leading resistance researcher Doug Richman tried exactly that experiment in his laboratory; it took only one replication cycle to produce the super-resistant strain.

Jill might be lucky. Perhaps her virus has not mutated into a drug-resistant strain, so

her medicines may still work. And she has a referral to a shelter, as well as a chance to get back into drug treatment and stabilize her life. Without this support, she might have been forced to exchange sex for a place to sleep. And if her virus had become resistant, she might have passed it on to her drug partners and her one-night landlord, where it could recombine with their HIV

strains and with those of their partners.

About 130,000 New Yorkers are thought to be infected with HIV. Will one of them add a multi-drug resistant strain to the viral meling pot? Says Richman, "It's only a matter of time."

Research assistance: GAMA DE JESUS E-mail: schoofs@echonyc.com

